UNITED STATES DEPARTMENT OF COMMERCE
U.S. Census Bureau
Washington, DC 20233-0001

2020 CENSUS PROGRAM MEMORANDUM SERIES: 2021.04

Date: January 21, 2021

MEMORANDUM FOR: The Record

From: Albert E. Fontenot, Jr. (signed January 21, 2021)
Associate Director, Decennial Census Programs

Subject: Documentation of Updates to the Internet Self-Response Operation

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This memorandum documents updates that have been made to the Internet Self-Response (ISR) operation since the release of the ISR Detailed Operational Plan (DOP) on August 22, 2018. Operational changes fall into two categories: the addition of Mobile Questionnaire Assistance (MQA) to the ISR operation, and changes related to the COVID-19 pandemic. These updates, summarized below, are provided to ensure accurate final documentation available to the public.

Mobile Questionnaire Assistance: The Census Bureau proposed a Mobile Response Initiative in response to the Joint Explanatory Statement accompanying the Consolidated Appropriations Act, 2019 (P.L. 116-6). The Mobile Response Initiative proposed to incorporate the use of technology to provide readily accessible ways for people to respond to the census. The highly mobile locations gave way to naming the program "Mobile Questionnaire Assistance," or MQA. The original purpose and scope of MQA are as follows:

> The Census Bureau will work with partners across the United States to identify key locations with prominent visibility in areas with low self-response rates. Possible locations include grocery stores and markets, houses of worship before and after services, community festivals, public transit hubs, libraries, community centers, and other locations where people naturally congregate. Initially, the MQA locations will be determined based on 2020 projected self-response rates. As households submit responses, real-time response rates will drive the MQA locations. Because this effort is not tied to specific physical locations, MQA staff can dynamically deploy to locations where they are most needed. MQA staff will help respondents answer questions and directly access the census questionnaire on Census Bureau-issued mobile devices

in English, or in one of 12 non-English languages, or call for assistance. In addition, MQA staff will also have language assistance guides for 59 non-English languages.

The scope of the program was refined because of the COVID-19 pandemic and the limitation on public events. The updated scope statement is:

1. Staff MQA sites in places where people visit when leaving home (as opposed to large public events), promoting and assisting with self-response.

2. Engage in activities that drive people to respond in the lowest responding neighborhoods.

MQA is not a stand-alone operation. For documentation purposes, MQA was included under the ISR operation. This initiative was added to the 2020 Census design after the publication of the Detailed Operational Plan for ISR and the v4.0 2020 Census Operational Plan. Thus, this is the only published document for the ISR operation that provides the full integration.

MQA provided specific opportunities for people to respond to the 2020 Census online and receive assistance with their response. As discussed below, within the Business Process Models, ISR 12-3.1.1 already showed the process for responses coming from partnership activities to enter the ISR application. This documentation is now updated to call out specifically the MQA partnership activity, as well as clarify that kiosks were not used for any outreach ISR activities. Additional details about MQA can be found in the MQA Project Plan.

Page 2, Section 2.1 – Operation Purpose: The first ISR DOP update is to the ISR operation purpose statement to include MQA. The updated statement follows.

The goal of the Internet Self-Response (ISR) operation is to communicate the importance of responding to the 2020 Census to the U.S. population and generate the largest possible self-response in order to reduce the need to conduct expensive in-person follow-up. At its highest level, ISR works toward this goal in three ways.

First, ISR develops communication and contact strategies to encourage the use of the internet as the primary response mode through a sequence of invitations and reminder mailings. These mailings are referred to as the stratified self-response mail strategy and historical response rates, internet access, and demographics are used to tailor the strategy in order to make responding as easy as possible.

A second key aspect of ISR is to increase high-quality responses by increasing the opportunity to and flexibility with which a person can respond. The primary way this is done is by providing an internet application that respondents can use at any time from nearly any location to respond online. This application can be used across most devices and browsers and can be displayed in multiple languages. Users may also respond through the application without a unique identification code, which is referred to as a Census ID or a User ID. These features enable ISR to be used seamlessly with the Mobile Questionnaire Assistance enumeration collection efforts.

Lastly, the ISR operation works to increase response to the census by working with other operations to provide the opportunity to respond using other collection modes. Namely, the ISR operation provides the application used by the Census Questionnaire Assistance operation

(CQA) to collect responses for those who call and respond over the telephone, as well as working with the Forms Printing and Distribution operation (FPD) to include paper questionnaires as part of the stratified self-response mail strategy.

- **Page 26, Section 3.1.1 – Develop Contact Strategy:** The 2020 Census mail strategy was updated to include two additional mailings. These additional mailings are because of the COVID-19 pandemic and the resulting extension of census field operations. A sixth mailing was added to the contact strategy for those housing units that had not yet responded by mid-July. In mid-August, a seventh mailing, which included a letter and questionnaire, was sent to nonresponding housing units in the lowest responding areas in the Internet First panel universe. Table 7 on page 26 would reflect these changes as follows:

Table 1: Mailing Panels and Materials

Panel	Number of Cohorts	Mailing 1	Mailing 2	Mailing 3*	Mailing 4*	Mailing 5*	Mailing 6*	Mailing 7**
Internet First	4	Letter	Letter	Postcard	Letter + Questionnaire	"It's not too late" Postcard	Postcard	Letter + Questionnaire
Internet Choice	N/A	Letter + Questionnaire	Letter	Postcard	Letter + Questionnaire	"It's not too late" Postcard	Postcard	N/A

* Targeted only to nonresponding households

** Targeted only to nonresponding households in lowest response areas

- **Page 36, Figure 11 – Collect and Validate Internet Responses [ISR 12-3.1.1]:** The note under 60.10 should be as follows: "Can also use tablet and special URL for Mobile Questionnaire Assistance (MQA)." This update both indicates the addition of the specific MQA activities as well as noting that kiosks were not used.

- **Page 38, Figure 12 – 3.3.1.2 Translate Non-English Content [ISR 12-3.1.2]:** The section heading should be updated to include "Non-Spanish" content, as in Figure 12. There is also some additional detail about how Non-English and Non-Spanish cases were routed for translation. Translation work was sent to both the Tucson Call Center (TCC) and the Decennial Translation Branch (DTB) at Census Bureau headquarters (HQ) to translate the content of responses flagged for translation. HQ support was added during the 2020 Census to clear the backlog of cases needing Non-English and Non-Spanish translation because of the temporary closure of the TCC that resulted from the COVID-19 pandemic.

The 2020 Census Memorandum Series

The 2020 Census Memorandum Series documents significant decisions, actions, and accomplishments of the 2020 Census Program for the purpose of informing stakeholders, coordinating interdivisional efforts, and documenting important historical changes.

A memorandum generally will be added to this series for any decision or documentation that meets the following criteria:

1. A major program-level decision that will affect the overall design or have significant effect on 2020 Census operations or systems.

2. A major policy decision or change that will affect the overall design or significantly impact 2020 Census operations or systems.

3. A report that documents the research and testing for 2020 Census operations or systems.

Visit 2020 Census on Census.gov to access the Memorandum Series, the 2020 Census Operational Plan, and other information about preparations for the 2020 Census.

2020 Census Detailed Operational Plan for: 12. Internet Self-Response Operation (ISR)

A New Design for the 21st Century

Issued: August 22, 2018
Version: 1.0
Prepared by: Decennial Census Management Division

United States™ Census Bureau

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Approvals

This ISR Detailed Operational Plan has been reviewed and approved for use.

Electronically Approved	7/17/2018
Kristen Hughes IPT Lead	Date Signed
Electronically Approved	8/8/2018
Tiffany Yowell (Acting) Branch Chief	Date Signed
Electronically Approved	10/26/2017
Alexa K. Jones-Puthoff IPT Program Manager	Date Signed
Electronically Approved	8/13/2018
Deborah M. Stempowski Chief, Decennial Census Management Division	Date Signed

Document Change History

Revision #	Version	Date	Description
1	v0.01	4/28/2016	Initial Working DRAFT Version from 2020 Census DOP template. Uses Annotated version of ISR BPM Version 3.5.
2	v0.02	7/18/2016	Draft version from IPT
3	v0.03	7/18/2016	Draft version with comments from MITRE
4	v0.04	12/6/2016	Draft version with updates and comments from MITRE
5	v0.05	12/12/2016	Draft version with DCMD revisions
6	v0.06	4/18/2017	Draft version with DCMD revisions
7	v0.07	8/31/2017	Draft version with comments from MITRE
8	v0.08	5/11/2018	Draft version with comments from IPT
9	v0.09	5/25/2018	Draft version with updated BPMs and DCMD revisions
10	v0.10	8/08/18	Draft version with DCMD revisions
11	V1.0	8/22/18	Final version

Note: Edit the fields below to update the Document Version, Date and Status in the Page Footers throughout the document.

Document Footer Information Control Table

Document Footer Information Control Table	
DocVersion:	Version v1.0
DocDate:	August 22, 2018
DocStatus:	Final

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1. Document Purpose

The 2020 Census Detailed Operational Plan for the Internet Self-Response (ISR) operation is intended for use by U.S. Census Bureau managers, staff, contractors, and other internal and external stakeholders working on the 2020 Census. The document presents the detailed operational design for the 2020 Census ISR operation and includes a summary of the operational processes involved, their inputs, outputs, and controls, and the basic mechanisms employed to conduct the operational work.

Anticipated uses of this document include the following:

- Communication—Documents operational design details for internal and external stakeholders.
- Planning—Documents planning assumptions and key milestones.
- Staffing—Documents staffing needs and strategies.
- Design—Describes operations and flows, which inform design of information technology (IT) systems, manual processes, and training.
- Development—Identifies business rules and required capabilities to be developed.
- Testing—Provides a basis for developing integrated test plans for IT systems and processes.

This document complements the 2020 Census Operational Plan, which presents the 2020 Census operational design and covers all operations required to execute the 2020 Census, starting with precensus address and geographic feature updates and ending once census data products are disseminated and coverage and quality are measured.

2. Operational Overview

2.1 Operation Purpose

The goal of the Internet Self-Response (ISR) operation is to communicate the importance of responding to the 2020 Census to the U.S. population and generate the largest possible self-response in order to reduce the need to conduct expensive in-person follow-up. At its highest level, ISR works toward this goal in three ways.

First, ISR develops communication and contact strategies to encourage the use of the internet as the primary response mode through a sequence of invitations and reminder mailings. These mailings are referred to as the stratified self-response mail strategy and historical response rates, internet access, and demographics are used to tailor the strategy in order to make responding as easy as possible.

A second key aspect of ISR is to increase high-quality responses by increasing the opportunity to and flexibility with which a person can respond. The primary way this is done is by providing an internet application that respondents can use at any time from nearly any location to respond online. This application can be used across most devices and browsers and can be displayed in multiple languages. Users may also respond through the application without a unique identification code, which is referred to as a Census ID or a User ID.

Lastly, the ISR operation works to increase response to the census by working with other operations to provide the opportunity to respond using other collection modes. Namely, the ISR operation provides the application used by the Census Questionnaire Assistance operation (CQA) to collect responses for those who call and respond over the telephone, as well as working with the Forms Printing and Distribution operation (FPD) to include paper questionnaires as part of the stratified self-response mail strategy.

2.2 Background

The 2020 Census includes sweeping design changes in four key areas: reengineering address canvassing, optimizing self-response, using administrative records (AR) and third-party data, and reengineering field operations.

ISR is one of the primary ways that the Census Bureau intends to optimize self-response by allowing people to respond from any location. Maximizing online responses reduces the need for more expensive paper data capture and in-person follow-up. The ISR operation was created in response to lessons learned from the 2010 Census, studies, and reviews, where it was recommended that in order to optimize self-response, the Census Bureau needed to determine the optimal contact strategies for eliciting responses to the 2020 Census and to develop an internet application for self-response that appeals to as many people as possible. Doing so would thereby

reduce the cost associated with mailing questionnaires to every housing unit in the nation, processing those that are returned, and the field infrastructure required to follow up with nonrespondents.

The 2020 Census will be the first to fully use online data collection, with the goal of having online self-response be the primary mode of data collection. The Census Bureau has the opportunity to further innovate and increase data quality by taking advantage of the capabilities of internet data collection, namely, the ISR application assists respondents through real-time edits and allows for more flexibility in data entry by the user than is possible with paper questionnaires. For example, larger households can be captured, data entry fields can accommodate more information, the user interface can be displayed in multiple languages far more effectively than a paper questionnaire, and internet collection can be done nearly anywhere at any time.

2.3 Design Overview

The sections below present the high-level design for the Internet Self-Response (ISR) operation. Please refer to the 2020 Census Operational Plan for a complete inventory of design decisions for all 2020 Census operations.

2.3.1 High-Level Operational Design

The design of the ISR operation for the 2020 Census includes three major operational activity areas:

- **ISR Planning and Preparation**
- **ISR Universe Management**
- **Internet Response Data Collection**

Each of these major activity areas is summarized below. Together, these activities represent the complete set of work that needs to be performed to conduct this operation.

ISR Planning and Preparation

The longest phase of the ISR operation is the planning and preparation. This phase is comprised of planning the contact strategy, establishing the business rules for creation of the self-response universes, and developing internet applications used for self-response.

First, the ISR operation prepares the stratified self-response contact strategy outlined above. Working with stakeholders, both within and external to the Census Bureau, ISR develops the method (e.g., letter, postcard, etc.) used to contact the public, the content or specific messaging contained in the contact, and the timing of the mail delivered to the public, inviting and reminding them to respond.

Secondly, the ISR operation is responsible for the creation of the business rules that establish and govern internet data collection universes, as well as the business rules that govern the flow of data into and out of the ISR applications. Specifically, the business rules for universe creation detail which addresses will receive each treatment of the contact strategy, as well as accounting for additional addresses that may be asked to self-respond that were not part of the initial self-response universe. These business rules also detail stratifications for language-specific mailing material and the timing of questionnaire mailings. ISR provides the Response Processing operation (RPO) with the contact strategy and these business rules for implementation in universe creation. The business rules for the flow of data in and out of the ISR systems detail the generation of status information about ISR cases, and how that information is to be used by other systems for overall universe management (see Figure 1 below).

Lastly, ISR is responsible for developing applications used for internet self-response. This work includes research with professionals in associated fields to maximize the user experience, and working with other operations to develop specific functionality to facilitate quality data collection and increase self-response. The ISR operation works with stakeholders to create the capability requirements for the ISR operation and works with the technical development teams to ensure that the requirements are carried out. The ISR operation also works with stakeholders to conduct user acceptance testing, and with the Census Bureau's Center for Survey Measurement to conduct usability and cognitive testing to optimize the user experience.

ISR Universe Management

ISR will manage updating the internet response universe according to the established business rules. Specifically, this includes ensuring that respondents and associated response data are flagged to be removed from the ISR universe once a completed internet response is received. This ensures that a respondent's data are securely transmitted to the Census Bureau and access to the response record is no longer possible for respondents. Additionally, as the status of cases in the self-response universe is updated by ISR (as people use the ISR application to respond to the census), the ISR operation sends status update information to RPO so that RPO can take the prescribed actions. For example, once a user has completed the census for an address, ISR notifies RPO, which then removes that address from any follow-up mailings or follow-up fieldwork.

Internet Response Data Collection

ISR will deploy an Internet Self-Response instrument, which is the online tool through which respondents will answer the census. ISR will also work with other operations to manage the collection of internet self-response data. First, this includes ensuring that respondent data are of the highest possible quality, through real time edit checks and through interfaces with Census Bureau applications and services, such as Non-ID Processing (NID). Next, ISR will work with other stakeholders and operations to deploy the business rules developed in the planning phase

that govern the flow of response data from the internet self-response application through other systems. ISR will also monitor the collection and transmission of internet response data, as well as the collection and transmission of paradata and application analytics and performance data, and will provide reporting of these aspects of internet data collection.

The full hierarchy of activities for the ISR operation is provided in Appendix C in the form of an Activity Tree. In the Activity Tree, each major operational activity area listed above is numbered and then decomposed into a numbered set of subactivities, some of which are further decomposed into more detailed numbered subactivities or steps.

For a full description of the operational subactivities that comprise the ISR operation, see the Detailed Process Description discussions in Section 3 below.

2.3.2 ISR Operational Context

The ISR operational activities described above are conducted within the context of other 2020 Census operations and other programs or data sources that are external to the 2020 Census Program. One way to depict an operational context is by using a "Context Diagram," which shows the boundary of the operational process, the operational activities it contains, and the information exchanged with its neighbor operations (or other entities) as well as the resources (mechanisms) needed to conduct the operational work.

Figure 1 is a top-level context diagram for the ISR operation represented as an Integrated Definition, Level 0 (IDEF0) model. An IDEF0 Model of a process (or operation) shows the Inputs, Controls, Outputs and Mechanisms of the process. These IDEF0 model elements are summarized below and described further in the sections that follow.

The yellow box in the center of the IDEF0 model lists the major operational activity areas for the operation, numbered as given in the ISR Operation Activity Tree in Appendix C. Specific Information Exchanges (IE) are shown in different colored boxes to represent the Inputs (green boxes on left side), Outputs (orange boxes on right side), Controls (purple boxes on top) and Mechanisms (blue boxes on bottom). Boxes to the left of the Inputs indicate the *Provider* of the inputs to the operation (typically another 2020 Census operation or an external source). The Provider of the Controls is noted in the box itself. Boxes to the right of the Outputs indicate the *Receiver* of the outputs (typically another 2020 Census operation or external entity). Each IE has a name and a unique number for identification purposes.

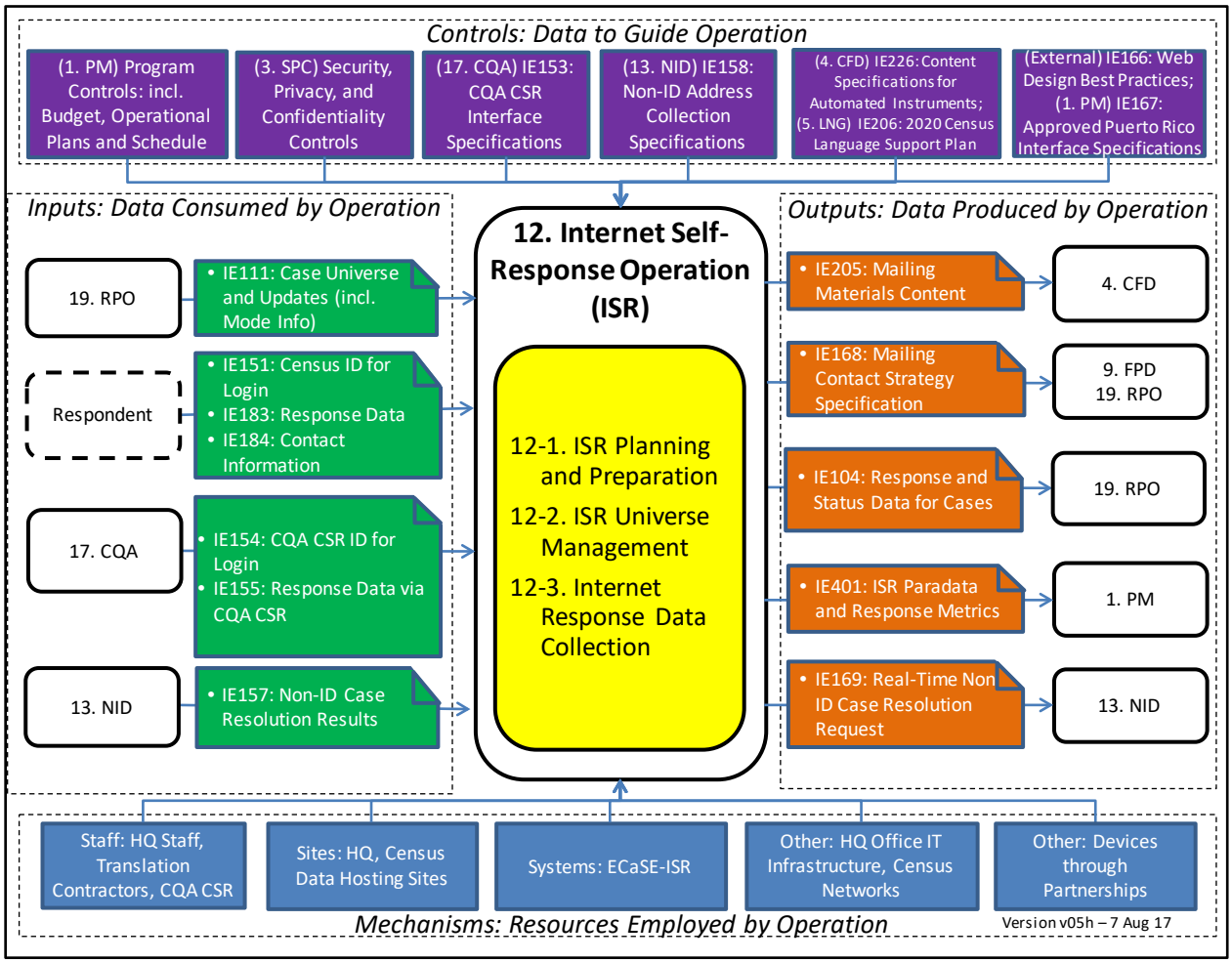

Figure 1: Internet Self-Response Operation (ISR) Context Diagram

ISR uses inputs from various other operations. Before the start of internet data collection, working across operations and with a number of stakeholder groups, the Content and Forms Design operation (CFD) provides the question wording, potential valid responses, help text, and edit messages for the ISR application. The Census Questionnaire Assistance operation (CQA), Non-ID operation (NID), and Puerto Rico (PR) all provide requirements for aspects of the ISR application specific to their respective operations. The Response Processing Operation (RPO) provides the initial universe for internet self-response. Once data collection begins, RPO provides updates to the overall universe while ISR manages the ISR universe and reports on response data collected.

The ISR operation is responsible for producing the requirements for mailing materials, as well as the business rules used in deployment of the mailing strategy. Additionally, ISR is responsible for defining and ensuring that appropriate data associated with internet self-response is collected and transmitted to other operations. These data consist of the actual response data (and includes

Non-ID data), paradata, metadata on the status of responses, and data about the performance of the internet self-response application.

The ISR operation is guided by program controls, legal requirements that ensure privacy, confidentiality, and security of response data, as well as web design and user experience best practices to ensure an optimal user experience of the ISR application. To meet the needs and requirements of the operation, ISR relies on Census Bureau Staff, IT infrastructure such as data hosting sites or other Census IT networks, as well as hardware used by Census staff assisting in internet self-response.

For detailed descriptions of the Inputs, Controls, Outputs, and Mechanisms used by the ISR operation, see the sections that follow.

2.3.2.1 ISR Operational Inputs

Inputs are the data that are consumed by the operation. The inputs define the amount of operational work that needs to be performed.

Table 1 lists the inputs to the ISR operation.

Table 1: ISR Operational Inputs

Provider	Information Exchange	Description
19. Response Processing Operation (RPO)	IE111: Case Universe and Updates (incl. Mode Info)	The set of cases (i.e. living quarters) to be enumerated and the expected response mode (internet, paper, update/enumerate) for each case.
Respondent	IE151: Census ID for Login	Unique login identification number used by respondents as they complete the Census via the internet instrument.
	IE183: Response Data	Data provided by the respondent in response to Census questions. For ISR, this includes information provided via the internet instrument.
	IE184: Contact Information	Contact information (e.g., telephone numbers) provided by respondents for follow-up when answering questions.

Provider	Information Exchange	Description
17. Census Questionnaire Assistance Operation (CQA)	IE154: CQA CSR ID for Login	Unique internet instrument login identification number used by CQA CSRs when conducting telephone interviews with respondents. This unique CQA CSR identifier is used for census questionnaire tracking and quality measurement.
	IE155: Response Data via CQA CSR	Data entered via the internet instrument by the CQA CSR on behalf of a respondent.
13. Non-ID Processing Operation (NID)	IE157: Non-ID Case Resolution Results	Non-ID matching and geocoding results from Real-Time Non-ID Processing (RTNP). Resolution results may identify a specific Master Address File (MAF) ID for the Non-ID Response Address (making it an ID Response) or may not be able to resolve Non-ID Address (in which case it remains a Non-ID Response).

2.3.2.2 ISR Operational Controls

Controls are the data that guide the behavior of the operation. They are not consumed by the operation, but rather they provide guidance, models, limits, criteria, cutoff dates, or other information that controls the way in which the operational work is performed.

Table 2 lists the controls for the ISR operation.

Table 2: ISR Operational Controls

Provider	Information Exchange	Description
1. Program Management Operation (PM)	Program Controls	Program Control information including: • Budget • Operational plans and schedule

Provider	Information Exchange	Description
1. Program Management Operation (PM)	IE167: Approved Puerto Rico Interface Specifications	Approval for the specifications of the Puerto Rico interface for the internet instrument.
2. Security, Privacy, and Confidentiality Operation (SPC)	Security, Privacy, and Confidentiality Controls	Laws, policies, regulations, and guidelines related to physical security, IT security, data security and privacy and confidentiality impacts, analyses, and processes. These include but are not limited to Title 13, Title 26, and other laws and policies related to protection of personally identifiable information.
17. Census Questionnaire Assistance Operation (CQA)	IE153: CQA CSR Interface Requirements	Requirements for the CQA CSR interface to the internet application interface. This interface is used when a CQA CSR conducts a telephone interview to collect response data from someone who has called in to respond to the Census. The CQA CSR Interface is formatted differently from the interface used by the public to respond. It is optimized to facilitate data capture over the telephone and reduce the amount of time required to complete the census questionnaire or provide other information.
13. Non-ID Processing Operation (NID)	IE158: Non-ID Address Collection Requirements	Non-ID address collection requirements for internet instrument.
4. Content and Forms Design Operation (CFD)	IE226: Content Specifications for Automated Instruments	Content (English and non-English) for automated instruments and additional content-related guidance, such as response option wording, skip patterns, and help text (includes GQ requirements). This operation uses the content specifications for the ISR and CQA internet instrument only.

Provider	Information Exchange	Description
5. Language Services Operation (LNG)	IE206: 2020 Census Language Support Plan	Document that specifies the number of languages and level of support for each language to be included in the 2020 Census. Issued Winter 2017.
External: Industry	IE166: Web Design Best Practices	Industry-recognized concepts and approaches for effective design of web-based data collection instruments.

2.3.2.3 ISR Operational Outputs

Outputs are the data produced by the operation. The outputs constitute the results of operational work that has been performed. Outputs produced may be used as inputs or controls to other operations.

Table 3 lists the outputs from the ISR operation.

Table 3: ISR Operational Outputs

Consumer	Information Exchange	Description
4. Content and Forms Design Operation (CFD)	IE205: Mailing Materials Content	Content for the nonquestionnaire paper materials supporting self-response. This is the content for materials that will be mailed or delivered to housing units inviting and reminding people to respond to the Census.

Consumer	Information Exchange	Description
9. Forms Printing and Distribution Operation (FPD) 19. Response Processing Operation (RPO)	IE168: Mailing Contact Strategy Specification	Business rules that define the sequence and timing of materials to be mailed to housing units inviting and reminding people to respond. The contact strategy rules are designed to encourage self-response via the internet. These rules also apply to additional mailings sent to nonresponding housing units based on administrative records modeling. During pre-data collection, these rules are used by RPO to create the initial mailing workload for self-response and Update Leave TEAs. During data collection, these rules are used by RPO to create the conditional mailing workload based on response and housing unit status.
19. Response Processing Operation (RPO)	IE104: Response and Status Data for Cases	Data that result from enumeration of cases and the associated status information. For ISR, the response data are the data captured via the internet instrument. Examples of status data include complete, partially complete, and blank.
1. Program Management Operation (PM)	IE401: ISR Paradata and Response Metrics	Status and progress data related to the data collection process. For ISR, this includes metrics on web usage, logins, incomplete responses, etc.

Consumer	Information Exchange	Description
13. Non-ID Processing Operation (NID)	IE169: Real-Time Non-ID Case Resolution Request	Non-ID address from a respondent or from a Census Questionnaire Assistance (CQA) CSR using an ISR application. During each Non-ID response, requests are made to a MAF matching service for the address, and may result in identifying a specific MAF ID associated with the address (making it an ID response). In some cases, the service may not be able to match the Non-ID address. These addresses are subject to processing that further attempt to derive a match or assign to a census block for data tabulation.

2.3.2.4 ISR Operational Mechanisms

Mechanisms are the resources (people, places, and things) that are used to perform the operational processes. They include Staff Resources, Infrastructure Sites, and Systems and other Technology Infrastructure.

Staff Resources

Table 4 identifies the Staff Resources employed for the ISR operation.

Table 4: Staff Resources Used Within ISR Operational Activities

Staff Resources	Description/Role
HQ Staff	HQ staff to manage the ISR operation and coordinate activities with translation contractors and CQA CSRs.
Translation Contractors	Contractors who translate response data provided in languages other than English or Spanish.
CQA Customer Service Representative (CSR)	Agents who collect census data on behalf of respondents via telephone interviews.

Infrastructure Sites

Table 5 identifies the Infrastructure Sites employed for the ISR operation.

Table 5: Infrastructure Sites for ISR Operational Activities

Infrastructure Site	Description/Role
HQ	HQ site for office work.
Census Data Hosting Sites	Secure facilities that are used to host census data and processing.

Systems and Other Technology Infrastructure

Table 6 identifies the System employed for the ISR operation.

Table 6: Systems Used Within ISR Operational Activities

System	Description
Enterprise Censuses and Surveys Enabling Platform (ECaSE)-ISR	Enterprise solution that supports 2020 Census operational work. For ISR and CQA, ECaSE is used to receive and transmit internet responses and other data associated with internet responses (cases status and paradata).

Other Technology Infrastructure employed for the ISR operation includes:

- HQ office IT infrastructure for conducting ISR operational work.
- Census Bureau network connectivity for data transmission between operational systems and operational sites.
- Devices deployed through the Integrated Partnership and Communications (IPC) operation's Partnership Program, if available.

2.4 ISR Data Flow and Operational Influences

Figure 2 is an Integrated Operations Diagram (IOD), which describes the design concepts for the response data collection operations for the 2020 Census (stateside and Puerto Rico). This diagram assumes that the frame has been developed and address canvassing operations are complete. The diagram shows the Response Processing Operation (RPO) as the hub of data collection and RPO's interactions with all the other 2020 Census operations that have a role in data collection. The discussion below walks the reader through the diagram, using the circled numbers to help the reader follow the flow.

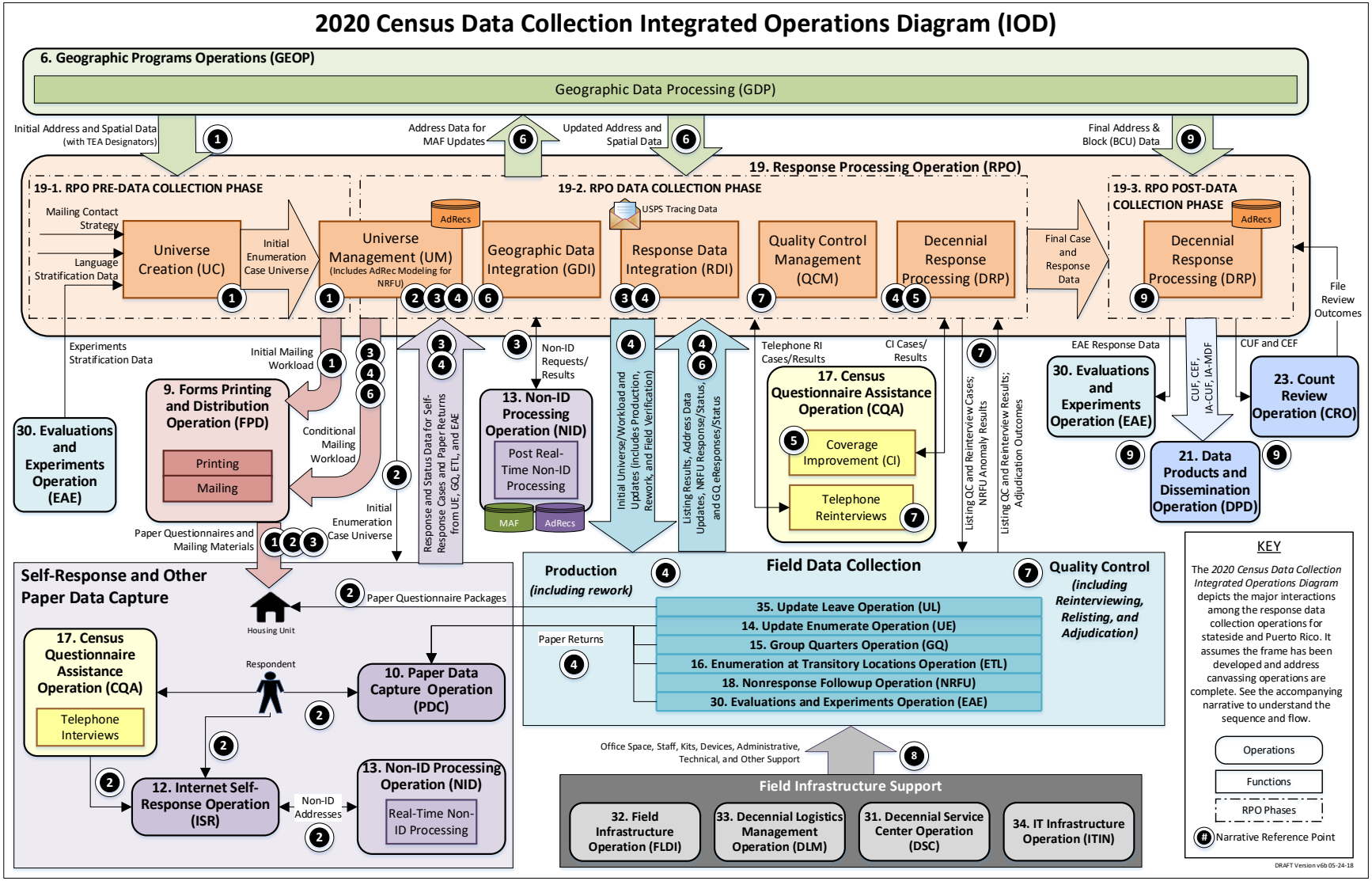

Figure 2: 2020 Census Data Collection Integrated Operations Diagram (IOD)

Pre-Data Collection

Before the start of data collection, the Geographic Data Processing (GDP) component of the Geographic Programs Operation (GEOP) sends initial Address and Spatial Data, including the Type of Enumeration Area (TEA) designations, to RPO so it can create the Initial Enumeration Case Universe. RPO also receives the mailing contact strategy (i.e., strategy for self-response stratification) so it can identify which housing units receive which kinds of mailings, language stratification information so it knows which language to use, and experimentation stratification data so it knows which housing units are to be included in what types of experiments. The creation of the initial Enumeration Case Universe and application of the stratification data are done as part of the RPO Universe Creation function.

Based on the stratifications, the RPO Universe Management function creates the initial mailing workload and sends it to the Forms Printing and Distribution Operation (FPD), which prints and then mails the appropriate materials to mailable housing units for the Self-Response (SR)TEA. The first two of the five potential mailings for the SR TEA are sent unconditionally to all housing units in this TEA. These mailings are sent in English or English and Spanish based on the language stratification data and may include letters or—based on the self-response stratification—questionnaires.

During Data Collection

Once the RPO Universe Creation work is complete, the Initial Enumeration Case Universe is managed by the RPO Universe Management function, which tracks changes to the enumeration universe for future mailings and for the data collection operations.

People living in housing units are encouraged to self-respond through a partnership and communications campaign (not shown on this diagram), through mailings sent by FPD, and through paper questionnaires left at housing units as part of the Update Leave Operation (UL).

To make it easy for people to respond and to reduce the paper questionnaire workload, the Census Bureau is using an *Internet First* strategy for most housing units. Respondents can go to the internet and enter their response using the internet self-response instrument as part of the Internet Self-Response Operation (ISR). The internet option offers additional flexibility and allows people to respond in multiple languages. If a respondent calls the Census Questionnaire Assistance Operation (CQA), a customer service representative may offer to collect the respondent's information by telephone. The information collected from these telephone interviews is entered by a customer service representative using an ISR-developed instrument similar to the public-facing instrument used by respondents.

Respondents can also mail paper questionnaire forms. These forms are received by the Paper Data Capture Operation (PDC), which uses scanning and imaging technology to capture the information from these forms.

ISR receives the Initial Enumeration Case Universe from the RPO Universe Management function and uses the Enumeration Case Universe to link responses provided through the internet instrument to the appropriate case. If respondents do not have their unique Census ID available, they are still able to complete the census questionnaire as a Non-ID response using the ISR instrument. The Non-ID Processing Operation (NID) first attempts to match the address entered by the respondent or customer service representative to a known census address in real-time. For addresses that do not match, the response is still collected and is subject to later Non-ID processing.

Response and status data collected through the various self-response data collection operations are sent (in digital format) to RPO's Response Data Integration function. Any responses collected through PDC or ISR that are submitted in languages other than English or Spanish are translated by staff at the Tucson call center on behalf of these operations before being sent to RPO. RPO's Universe Management function uses the response status data to determine the appropriate actions for the case.

During the self-response data collection time-period, reminder mailings are sent to housing units in the SR TEA. The first reminder is sent to all housing units in the SR TEA using the initial mailing workload as discussed above. Subsequent reminders are conditional and are only sent to those housing units that have not yet responded. The RPO Universe Management function sends a Conditional Mailing Workload to the FPD operation for these nonresponding units. FPD also receives from the RPO Universe Management function a list of mailable housing units in the UL TEA and mails two reminders to these housing units. FPD also receives from the RPO Universe Management function a list of mailable housing units in the UL TEA and mails two reminders to these housing units.

Any remaining Non-ID cases are sent by RPO to NID for post real-time Non-ID processing, which attempts to match addresses provided by respondents to known addresses in the Master Address File (MAF) using automated and clerical procedures. As needed, administrative records (AdRecs) are used to supplement the matching process. Most of these Non-ID cases will be from internet responses that could not be matched during real-time Non-ID processing. In addition, post data capture Non-ID processing will be required for paper forms for which the Census ID could not be read during data capture. The results of post real-time Non-ID matching are sent back to RPO. Based on pre-defined business rules, some of the responses that are not able to be matched through NID are sent to the field for verification as part of the Nonresponse Followup Operation (NRFU).

The discussion above covers self-responses for people living in housing units. Special operations also exist to collect data from people living in other types of living quarters or for whom self-response is not a viable option:

- The Group Quarters Operation (GQ) enumerates people living in group quarters (e.g., dormitories, correctional facilities, and nursing/skilled-nursing facilities) as well as people experiencing homelessness and receiving services at service-based locations such as soup kitchens. GQ also enumerates people living on maritime vessels and receives administrative records for people living in the Military TEA, which includes both on-base group quarters and on-base housing units.
- The Enumeration at Transitory Locations Operation (ETL) enumerates people who are living in special locations--such as recreational vehicle parks, campgrounds, racetracks, circuses, carnivals, marinas, hotels, and motels--and who do not have a Usual Home Elsewhere.
- The Update Enumerate Operation (UE) lists and enumerates housing units in areas that pose unique challenges to the standard self-response data collection operations. These housing units are in the UE and Remote Alaska TEAs, which cover remote areas of the country and other small selected areas.

NRFU is another special operation whose primary purposes are to determine the housing unit status of addresses in the SR and UL TEAs for which a self-response was not received and to enumerate those that are believed to be occupied. As mentioned in number 3 above, NRFU also performs a field verification activity to verify selected addresses for Non-ID self-responses that could not be matched to known addresses through NID.

Based on the universe case type (derived from TEA and living quarter type), RPO sends the Initial Enumeration Case Universe/Workload to the GQ, ETL, and UE operations. GQ uses this universe to perform an advance contact activity to collect general information and determine the preferred method of enumeration. ETL also performs an advance contact activity to schedule appointments for enumerating its universe of cases.

NRFU does not require advance contact activities. For NRFU, the RPO Universe Management function creates an Initial Case Universe/Workload based on an AdRec modeling activity. Four possible status outcomes result from this modeling for a given address:

- AdRec Vacant: No one lives there.
- AdRec Delete: There is no housing unit at that address.
- AdRec Occupied: There is a high probability that someone lives there and the Census Bureau has high-quality data about that housing unit.

- AdRec No Determination: Administrative data are not sufficient to help determine the housing unit status.

Only those addresses that are determined to be AdRec Occupied or AdRec No Determination are included in the initial NRFU workload. AdRec Vacant and AdRec Delete housing units receive an additional mailing from FPD. The RPO Universe Management function provides this additional mailing workload to FPD (as another type of Conditional Mailing).

For AdRec Occupied and AdRec No Determination cases, NRFU sends to RPO information regarding the success of an enumeration attempt as part of the response status data. NRFU makes multiple attempts to enumerate AdRec No Determination cases and only one attempt for AdRec Occupied cases. For AdRec Occupied Cases that cannot be successfully resolved during this one attempt, RPO removes these households from the followup workload and triggers one final mailing (from FPD) to encourage them to self-respond.

Self-responses can continue to arrive at any time during NRFU. Accordingly, RPO flags housing units in the follow-up workload for which RPO has received a self-response or tracing information from the United States Postal Service (USPS) that indicates that a return is on its way to one of the paper data capture facilities. NRFU is notified about these flagged households as soon as the information is available so that it can remove the housing units from the daily workload, if possible. Any self-responses that are flagged but later found by RPO to have insufficient enumeration data are added back to the NRFU workload for continued enumeration attempts. The RPO Universe Management function tracks this information and uses it to determine what to include in the next day's follow-up workload. Housing units that have been successfully enumerated are not included in subsequent follow-up workloads.

For NRFU, field data are collected by electronic devices. The electronic data are sent to the RPO Response Data Integration function, which subsequently provides this information to the Decennial Response Processing function for further processing. Paper questionnaires are used to enumerate at living quarters during UE and at housing units during ETL. These paper questionnaires are checked-in at area census offices (ACOs) and then sent to the paper data capture facilities, where they are scanned and imaged by PDC. PDC sends the captured data and case status information to RPO in digital format.

GQ is primarily a paper operation. Group quarter responses collected on paper questionnaires are checked-in at the ACOs and sent to PDC for scanning and imaging before being transmitted to RPO. Case status updates are sent to RPO as part of the check-in process. GQ data provided in electronic files (eResponses) require additional processing to prepare the data before they are electronically transmitted to RPO. GQ data collected on paper rosters are entered by ACO clerks into the same file format that is used for eResponses. These response data are then sent electronically to RPO.

As part of the Evaluations and Experiments Operation (EAE), the Census Bureau may test different questionnaire content and data collection methodologies during the 2020 Census to help evaluate content and modes for the 2020 Census and inform design changes for the 2030 Census. Addresses that are selected to be part of these experiments are identified in the initial universe (see number 1 above). For those addresses, the EAE operation collects the data and provides responses and status of responses to the RPO Response Data Integration function, which subsequently provides this information to the Decennial Response Processing function. Any responses collected by EAE on paper returns are processed by PDC and sent by that operation to RPO.

RPO's Decennial Response Processing function performs quality assurance activities as well as coding and other preparation steps on incoming self-response data.

The RPO Universe Management function also supports a Coverage Improvement (CI) activity, the goal of which is to ensure a high-quality census by conducting telephone follow-up for households where there could be coverage issues on submitted responses. CI is a follow-up activity and is therefore considered a component of NRFU; however, the CI telephone interviews are performed by CQA. CQA receives from the RPO Universe Management function a set of cases with potential coverage issues and provides the results of these cases back to RPO's Response Data Integration function.

As noted above, universe and address updates occur during field operations. Census Bureau field staff may uncover changes to addresses as they perform their daily assignments in any field operation. For example, a UL or UE lister may add an address or find an error in the address or geographic data based on the listing activities, or a NRFU enumerator or a UL lister may go to an address and find an additional unit such as a garage apartment located on the premises. All listing results and other address changes are sent to the RPO Geographic Data Integration function, which passes the information on to the GDP function in GEOP.

Changes to the address list may also come from other sources such as appeals from the Local Update of Census Addresses Operation (LUCA), the review of addresses performed by the Count Review Operation (CRO), and updated files from the postal service. The GDP function within GEOP updates the address data and sends these RPO's Universe Management Function, which provides these cases to the appropriate operation. Depending on the timing, living quarter type, and TEA designation, RPO may initiate one or more mailings to these new addresses through FPD to encourage self-response.


All field operations (GQ, UL, ETL, UE and NRFU) include quality control (QC) functions. For GQ, the RPO Quality Control Management function creates and sends a sample of the field enumeration cases to ACO staff, who conduct telephone reinterviews for this sample set of cases to confirm that a GQ enumerator visited the site and that the total population count is correct.

For UL, the RPO Quality Control Management function selects a sample set of basic collection units (BCUs) for relisting. The QC Listing Results are sent back to the RPO Quality Control Management function for further processing. RPO does not send any changes resulting from UL listing to GEOP until the lister has passed the QC check. Further, if the QC activities result in a hard fail, BCUs already worked may require relisting. RPO includes this rework in subsequent UL production workloads.

QC methods for ETL and UE will be performed primarily in the field, tailored to meet the circumstances of these unique paper-based operations.

NRFU includes multiple methods for ensuring high-quality data collection. Several of these are integrated into the staff management activities. In addition, samples of field follow-up cases are selected for reinterview (RI), a process whereby the response data are collected again and compared to the original collected data. The RPO Quality Control Management function creates the RI workload and sends it to the CQA or NRFU operation. Those RI cases for which a valid telephone number has been provided are contacted by CQA on behalf of NRFU. The remaining RI cases, as well as those that cannot be reached by telephone, are handled by NRFU field staff. The RI results are sent to the RPO Quality Control Management function, which performs an automated comparison of the RI data against the original data. Anomalies are sent back to NRFU, where additional research is conducted to determine how these cases should be handled. The results of this review (adjudication outcomes) are sent back to the RPO Quality Control Management function. In some cases, the adjudication requires that prior cases performed by the enumerator at fault be reworked. RPO puts these cases back into the NRFU workload as appropriate.


NRFU, UE, UL, ETL, and parts of the GQ Operation are performed in the field. Several operations provide the support for these field data collection activities. The Field Infrastructure Operation (FLDI) recruits, hires, onboards, and trains the staff needed to conduct these operations and also operates the field offices during production. The Decennial Logistics Management Operation (DLM) provides the space and logistics support (e.g., supplies, kits, etc.) for the offices and the field staff. The Decennial Service Center Operation (DSC) provides technical support for field and field office staff. Finally, the IT Infrastructure Operation (ITIN) provides the hardware and software used by the field staff and field offices.

Post-Data Collection

Once data collection is complete, additional processing occurs to prepare the counts for use in apportionment and the data used by the Data Products and Dissemination Operation (DPD) to create data products for redistricting and other purposes. The RPO Decennial Response Processing function handles this post-data collection processing, which includes multiple activities:

- Supplementing response data with administrative records for those cases that had been identified as AdRec Occupied but for which a nonresponse follow-up attempt was unsuccessful and no subsequent self-response was received.
- Determining the final enumeration universe by reconciling or applying final address and block data from the GDP component of GEOP.
- Determining the returns of record for situations where multiple responses have been received for the same housing unit.
- Performing count and status imputations.
- Performing consistency editing and characteristic allocation supplemented with administrative records data.
- Applying tabulation geography.
- Performing disclosure avoidance (Note: This is done by RPO for Island Areas Censuses data only. Disclosure avoidance for Stateside/PR data is handled by DPD).

Similar processing occurs for responses from group quarters. Responses collected through the EAE operation may require slightly different activities.

Through these processing activities, the RPO Decennial Response Processing function creates multiple files for Stateside/PR response data, including the Decennial Response File (DRF), the Census Unedited File (CUF), and the Census Edited File (CEF). RPO also creates an Island Areas CUF (IA-CUF), Island Areas CEF (IA-CEF), and Island Areas Microdata Detail Files (IA-MDF) for the Island Areas Censuses (IAC) response data. Each of these files is reviewed within the Census Bureau before the data are sent to the next stage of processing: Some of these reviews are done as part of the CRO. The CUF, the CEF, the IA-CUF, and the IA-MDF are sent to DPD via the Census Data Lake (CDL). DPD uses these files as inputs for data products creation and also creates the Stateside/PR MDFs using the CEF as input. RPO also sends data collected as part of EAE back to the EAE operation for further analysis.

2.5 ISR Design Assumptions

- The ISR application should be designed to handle concurrent users and other systems' demands, as defined by the external demand models under development by the IT Infrastructure and Census Enterprise Data Collection and Processing (CEDCaP) program, under the guidance of Systems Engineering and Integration.
- The ISR application should be responsively designed so that it is accessible across most modern technologies (desktop or mobile platforms).
- The ISR application should be designed for use by people with disabilities (Section 508 Compliance).
- The ISR application should send completed response data to downstream processing systems and operations in real time.
- The ISR operation should send response data and case status data to RPO such that once a census response has been completed for a Census ID, that case will be removed from future self-response mailings.
- The ISR operation should update the self-response universe used by the ISR application to prevent more than one response to the census for a Census ID.
- The ISR operation should ensure that all data associated with an address are transmitted to RPO when the data are received, to increase security.
- The ISR application should display real time edits to respondent within the ISR application to improve data quality, in a way that improves the user experience.
- The ISR application should allow larger households to completely self-respond without the limitations that may be a constraint in other collection modes.
- The ISR application should allow a person without a Census ID to respond, provided the person can provide an address adequate for processing by the matching and geocoding service, Real Time Non-ID Processing (RTNP). This will include people who have no permanent residence.

3. Internet Self-Response Operation (ISR) Detailed Process Description

Figure 3 is a top-level Business Process Model (BPM) showing the Level 1 activity areas within the ISR operation. BPMs for the 2020 Census follow industry-standard Business Process Model and Notation (BPMN). An explanation of how to read the BPMN notations and a full sized copy of all of the BPMN diagrams for this operation are provided under separate cover.

This top-level BPM serves as the Context Model for the ISR operation. A BPMN Context Model displays the high-level activities within the operation and relationships between them, whereas the IDEF0 Context Diagram shown earlier depicts the boundaries of the operation or activity and the interfaces between the operation or activity and other operations and activities with which it is associated.

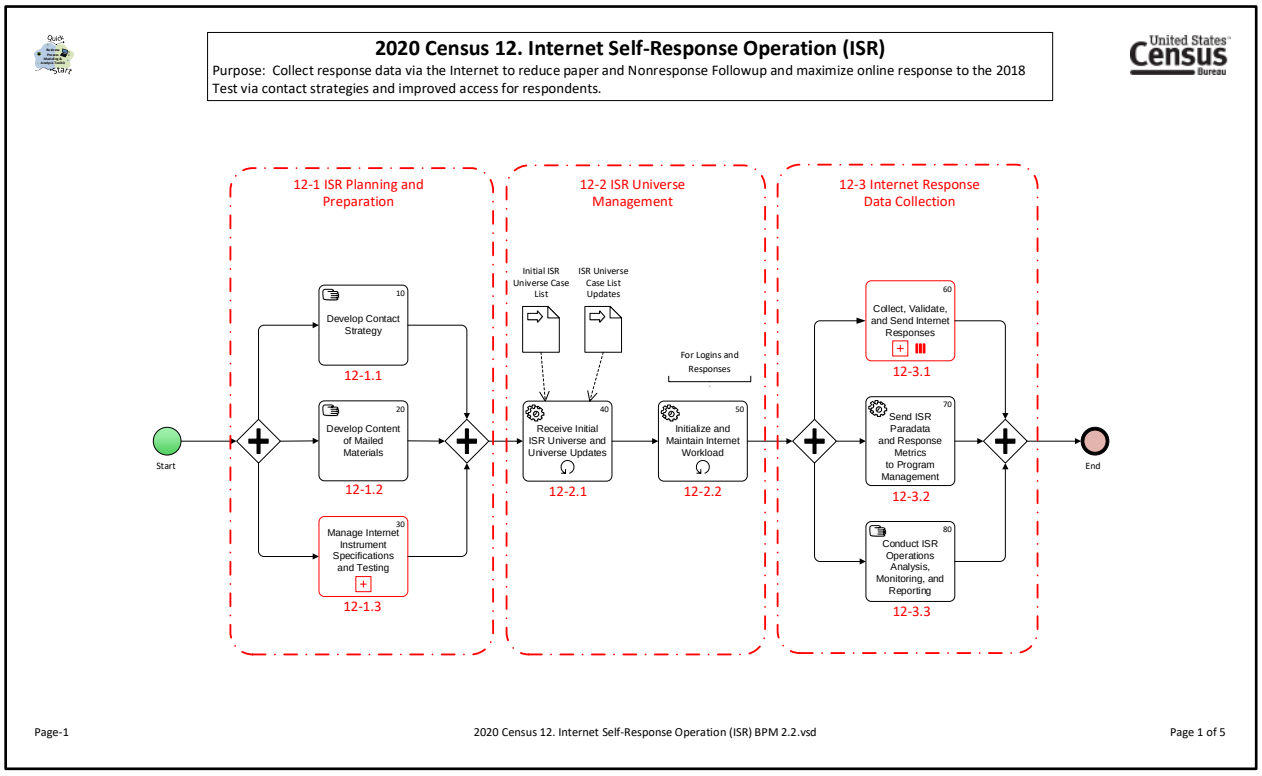

Figure 3: ISR Operation Context Model

The ISR operation is subdivided into the following activity areas:

- ISR Planning and Preparation [ISR 12-1]
- ISR Universe Management [ISR 12-2]

- Internet Response Data Collection [ISR 12-3]

The business processes for each of these Level 1 activity areas are discussed along with their inputs and outputs in the following subsections.

3.1 ISR Planning and Preparation [ISR 12-1]

Figure 4 shows the BPM for the ISR Planning and Preparation [ISR 12-1] activity area (area within the gray rounded rectangle) and its constituent activities within the overall context of the ISR operation.

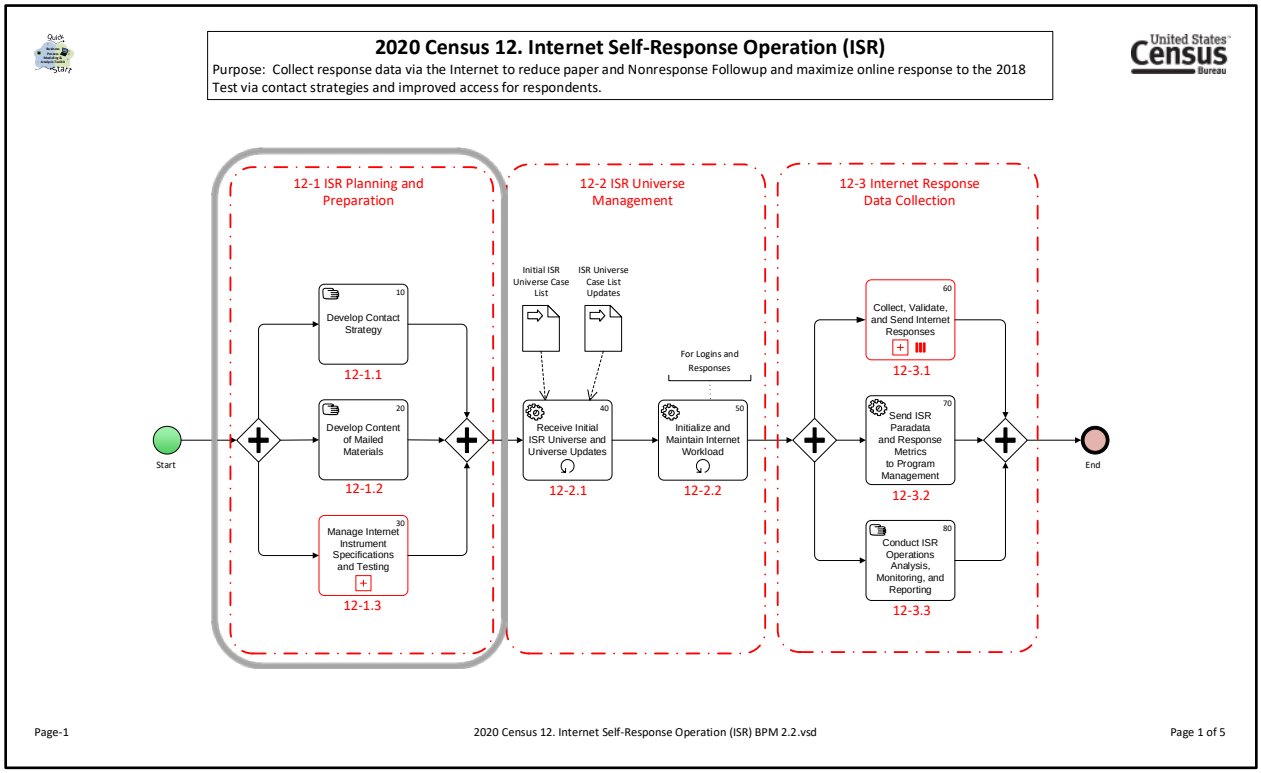

Figure 4: ISR Planning and Preparation [ISR 12-1] Constituent Activities

The ISR Planning and Preparation activity area is subdivided into the following operational subactivities.

- ISR Planning and Preparation [ISR 12-1]
  - Develop Contact Strategy [ISR 12-1.1]
  - Develop Content of Mailed Materials [ISR 12-1.2]
  - Manage Internet Instrument Specifications and Testing [ISR 12-1.3]

The ISR operation creates, collects, and refines requirements for the ISR application and the mailing contact strategies, then works to develop the content of the mailing materials and design

of the ISR application from these requirements. As the ISR Application is developed, the ISR Operation manages project level testing to identify any defect and ensure that operational requirements are met. The ISR operation also defines the business rules that govern data management of the ISR universe in the planning and preparation phase of the operation.

Subsequent sections describe the ISR Planning and Preparation operational subactivities in detail.

3.1.1 Develop Contact Strategy [ISR 12-1.1]

"Develop Contact Strategy" is the first activity performed as part of the ISR Planning and Preparation activity area.

ISR will use a mailed contact approach to invite multimode self-response (responding by internet, completing a paper questionnaire, or by calling CQA). As outlined in section 2.1, the primary purpose of the stratified self-response contact strategy is to inform and invite the public to respond to the census, and to remind non-responders to respond. Throughout the decade, the ISR operation, as part of the optimizing self-response research, has tested various strategies to maximize self-response through the mailings. These tests have used various forms of mail contacts, such as letters, postcards, and questionnaires, as well as different timings of the mail deliveries to the public. The resulting strategy that the ISR operation will deploy in the 2020 Census will mail invitations, reminders, and questionnaires over the course of approximately six weeks. These mailings are divided into two panels: the "Internet First" panel and the "Internet Choice" panel, as shown in Table 7.

Table 7: Mailing Panels and Materials

Panel	Number of Cohorts	Mailing 1	Mailing 2	Mailing 3*	Mailing 4*	Mailing 5*
Internet First	4	Letter	Letter	Postcard	Letter + Questionnaire	"It's not too late" Postcard
Internet Choice	N/A	Letter + Questionnaire	Letter	Postcard	Letter + Questionnaire	"It's not too late" Postcard

* Targeted only to nonresponding households

The Internet First panel will emphasize online response as the primary self-response option. Specifically, this panel will begin with an invitation letter that alerts the public to the beginning of the 2020 Census and provides the Census ID and URL for the ISR application. After the invitation to respond, there will be two reminders to respond, with the first being a reminder

letter and the second, a reminder postcard. If the ISR operation has not received a response after the third mailing, a paper questionnaire is then mailed. If there is still no response, a final reminder postcard is mailed. If neither a paper response nor an ISR or CQA internet response is received after the final reminder, the RPO operation includes the address in the workload for the Nonresponse Followup (NRFU) operation.

Additionally, in order to distribute the demand on data collection and processing systems and the call volume to the CQA operation, the Internet First panel will be further divided into four separate cohorts. These cohorts will be staggered, instead of delivering all material on the same day for each of the five mailings. This strategy was developed through demand modeling work that was itself based on demands placed on systems and operations in each of the census tests conducted throughout the decade.

The Internet Choice panel is targeted to those areas of the nation that are least likely to respond online. The ISR IPT uses data on historical response rates from other Census Bureau surveys, internet access and penetration, and demographics to determine those areas least likely to respond online. The mailings in these areas present both paper response and internet choice as primary response options, but also include information on contacting the CQA operation as well. The first mailing of this panel includes a letter that alerts the public to the beginning of the 2020 Census, but includes a paper questionnaire in the mailing as well as the Census ID and URL of the ISR application. Afterward, two reminder mailings—a letter and a postcard—are mailed. These are similar to the Internet First reminders, but with slightly modified content. For those that have not responded after the second reminder, a second questionnaire is mailed in the fourth mailing. Again, similar to the Internet First panel, a fifth and final reminder postcard is mailed to those non-respondents after the fourth mailing. If no response is received, RPO includes the address in the workload for NRFU.

The Internet Choice panel will not be further divided in cohorts to be mailed out over a multiday window, but will be mailed out around the same time as the earliest cohort of the Internet First panel. Getting paper questionnaires to these areas as early as possible maximizes the time the Paper Data Capture (PDC) operation has to receive and process the paper returns.

Lastly, the self-response contact strategy is further tailored to better meet the language needs of the nation. Specifically, each panel and cohort is stratified into English and bilingual mailings to facilitate the accessibility of self-response.

3.1.2 Develop Content of Mailed Materials [ISR 12-1.2]

“Develop Content of Mailed Materials” is the second activity performed as part of the ISR Planning and Preparation activity area.

The ISR IPT works with stakeholders, both within the Census Bureau and external, to develop a draft of the content for all the mailing materials for self-response. The content of the self-response mailings has been developed using research and testing of mailings of other Census Bureau surveys, testing of messaging in census tests throughout the decade, as well as research and recommendations from external stakeholders. This draft is then delivered to the Content and Forms Design (CFD) operation, which finalizes the content and design of the mailed materials. CFD delivers the final print files for each material to the Forms, Printing and Distribution operation (FPD), which oversees the selected print vendor that creates the actual mailing material for self-response.

3.1.3 Manage Internet Instrument Specifications and Testing [ISR 12-1.3]

"Manage Internet Instrument Specifications and Testing" is the third activity performed as part of the ISR Planning and Preparation activity area.

The "Manage Internet Instrument Specifications and Testing" operational subactivity is subdivided into the following constituent activities.

- Manage Internet Instrument Specifications and Testing [ISR 12-1.3]
    - Develop Internet Instrument Specifications [ISR 12-1.3.1]
    - Test and Approve Internet Application [ISR 12-1.3.2]

A detailed view of the constituent activities that make up the "Manage Internet Instrument Specifications and Testing" operational subactivity is given in Figure 5 below.

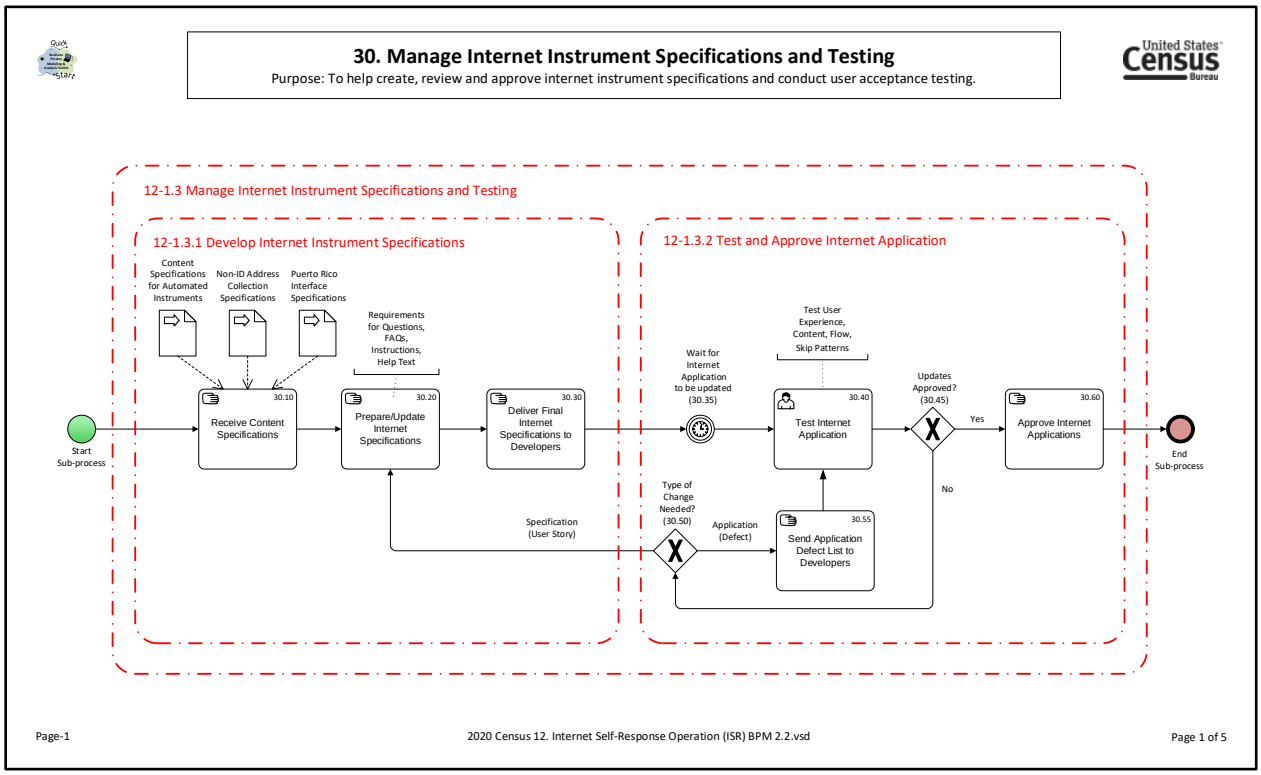

Figure 5: Manage Internet Instrument Specifications and Testing

3.1.3.1 Develop Internet Instrument Specifications [ISR 12-1.3.1]

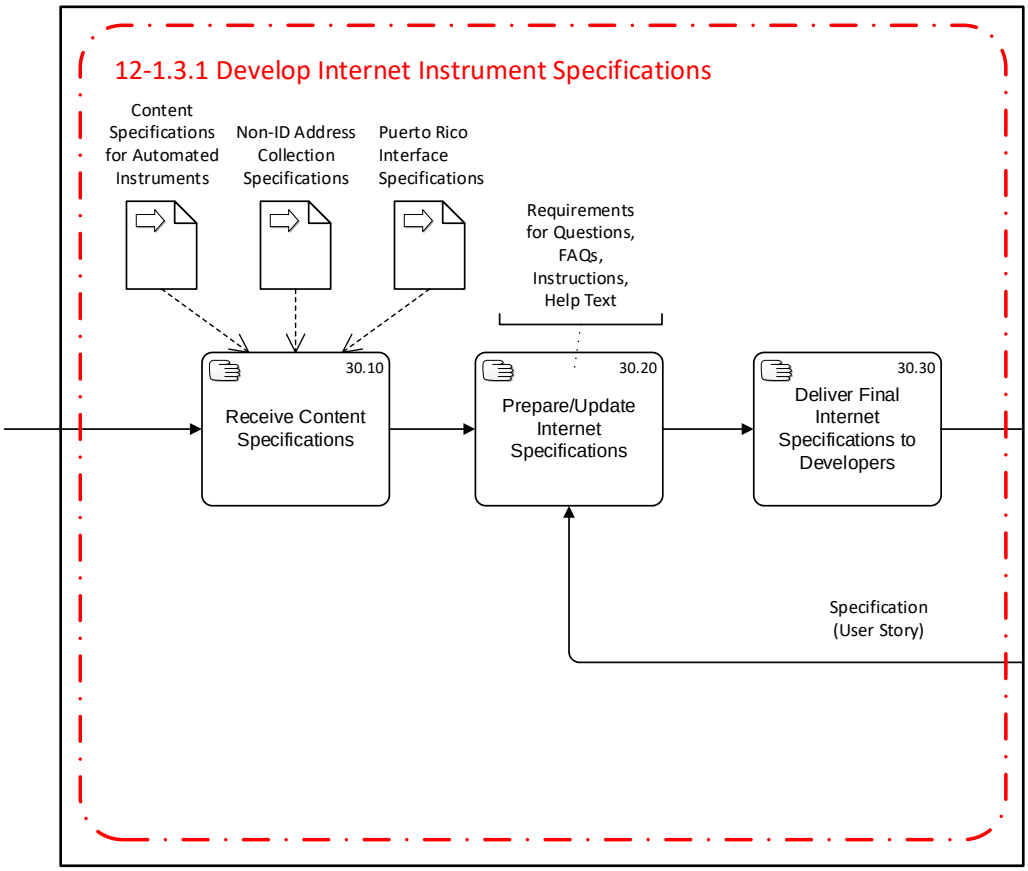

Figure 6: Develop Internet Instrument Specifications

The ISR application is a web-based software application that is developed by a commercial off-the-shelf (COTS) vendor. The software is part of a larger data collection and management platform developed by the COTS solution provider. Development is managed within the Census Enterprise Data Collection and Processing (CEDCaP) Program. The COTS solution provides systems development resources who build the ISR application, as well as the application used to collect Census Questionnaire Assistance (CQA) responses, atop the integrated platform. CEDCaP and the ISR operation provide a Product Owner who works as a liaison between the operation and the COTS development team. For the ISR operation, the ISR IPT Lead is the ISR operations manager, in order to ensure that stakeholder and operational requirements are met.

The ISR Operation receives specifications from Content and Forms Design, Non-ID, and Puerto Rico and Island Areas Enumeration branches. The ISR Operation reviews and develops a final Internet Instrument Specification. Next, the ISR Operation delivers the final Internet Instrument Specification to the ECaSE ISR Product Owner. The Product Owner integrates the requirements of the operations described in the design overview 2.3.1, leads the creation of user stories for the

developers, works with the development team to prepare and prioritize user stories for development, tests and reviews development efforts within the development team, and approves or rejects the development work.

3.1.3.2 Test and Approve Internet Application [ISR 12-1.3.2]

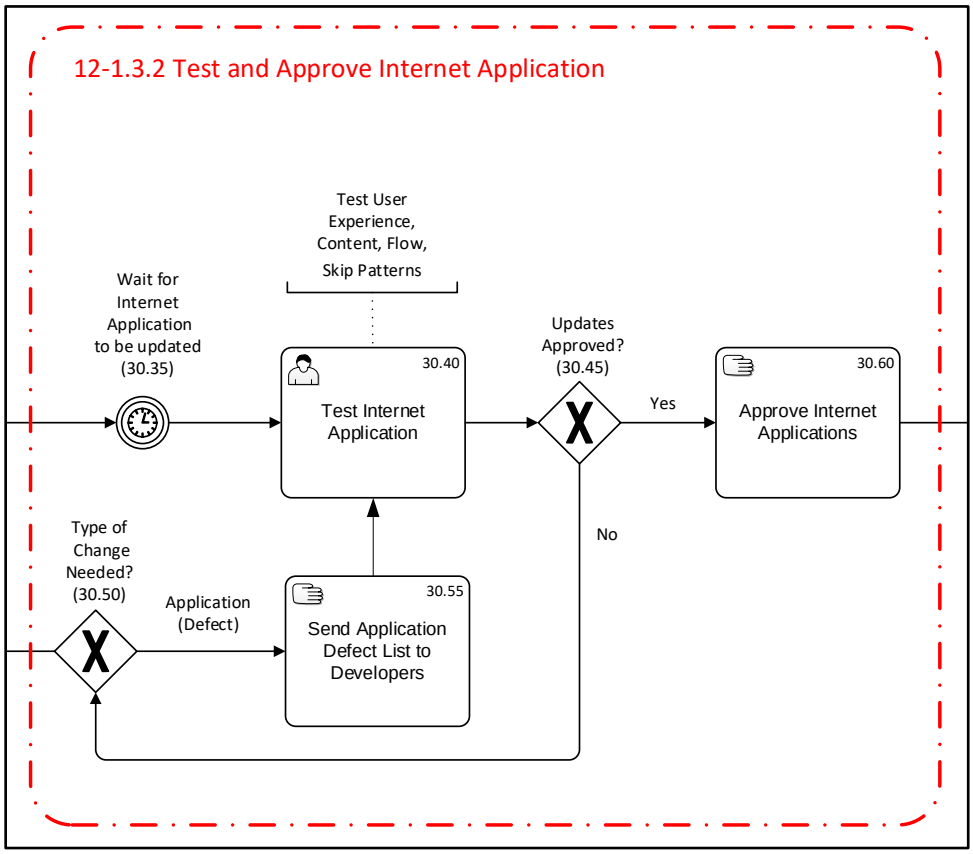

Figure 7: Test and Approve Internet Application

Lastly, The IPT Lead coordinates testing (usability, user acceptance) and review of development work with stakeholders and works with the Product Owner to provide immediate remedy to problems and rapid resolution to issues as they are uncovered during review. Once the testing and review are complete, the ISR Operation approves and signs off on the final ISR Application.

3.2 ISR Universe Management [ISR 12-2]

Figure 8 shows the BPM for the ISR Universe Management [ISR 12-2] activity area (area within the gray rounded rectangle) and its constituent activities within the context of the overall ISR operation.

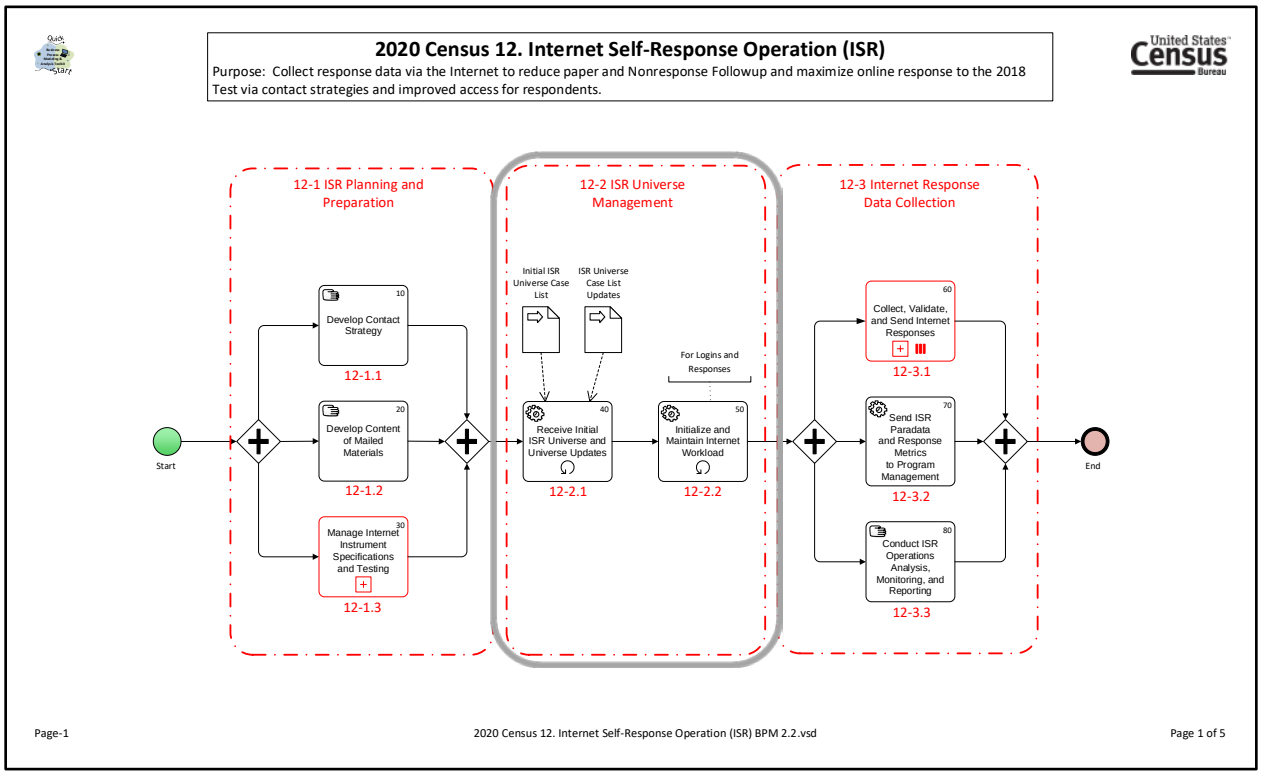

Figure 8: ISR Universe Management [ISR 12-2] Constituent Activities

The ISR Universe Management activity area is subdivided into the following operational subactivities.

- ISR Universe Management [ISR 12-2]
  - Receive Initial ISR Universe and Universe Updates [ISR 12-2.1]
  - Initialize and Maintain Internet Workload [12-2.2]

For clarity, it is useful to consider how the terms “Universe” and “Workload” have been used by RPO and the other operations, namely:

- A Universe is the set of all known response data collection cases that may respond at some point in the operation. Responding to a case **does not** reduce the universe.
- A Workload is the set of all remaining cases for which a response is yet to be collected within the operation. Responding to a case **does** reduce the remaining workload.

From RPO’s perspective, the “ISR Universe” is what is provided to ISR and consists of all ID cases known to RPO that may respond through ISR.

From ISR’s perspective, the “Internet Workload” is what is initialized from the RPO provided ISR Universe and maintained by ISR to track the progress of internet response.

For the 2020 Census, RPO expects to provide approximately 143 million unique "ID cases" (those with a Census ID) to make up most of the initial internet workload. Additionally, internet responses triggered by Update Leave (UL) questionnaires and NRFU Notice of Visit forms left at housing units will add cases to the workload during the field operation. The ISR operation will ensure that the cases that are created through RPO are ingested by the ISR application and are available for use. After data collection begins, ISR will monitor the workload to be sure that as a response associated with a unit/address in the internet workload is received, that unit/address is removed from the workload. ISR will also report on status and provide collected response data from the received internet responses associated with these records in the workloads. It should be noted that, since respondents that submit responses without a Census ID (non-ID cases) cannot be known in advance, Non-ID is not part of the initial internet workload.

Subsequent sections describe the ISR Universe Management operational subactivities in detail.

3.2.1 Receive Initial ISR Universe and Universe Updates [ISR 12-2.1]

ISR is responsible for ensuring that the initial ISR Universe is ingested for use by the internet instrument, and will check the initial universe to ensure that business rules for universe creation have been followed.

The ISR Universe has the potential to be updated as additional ID cases become known to RPO from the Supplemental Universe, and so the ISR Universe will potentially grow over time. The Supplemental Universe will add new Census IDs, and these will become eligible as new ISR ID cases. ISR will need to be given these new cases by RPO before the respondents are sent their IDs, so the respondents will be able to use them to respond online.

For the UL questionnaires and NRFU Notice of Visit forms left at housing units during field operations, the temporary form identifiers (temporary IDs) provided to respondents for online ISR response are known ahead of time, so the address/case linkage for these identifiers can be added to the Universe in RPO after they are used for ISR response. ISR can accept responses for these cases as "temporary ID" cases based on the temporary identifiers even if the Universe update in RPO has not yet been completed. As long as ISR knows the full range of identifiers allowed for UL questionnaires and NRFU Notice of Visit forms, RPO will not need to send the actual Census IDs or Processing IDs for these cases to ISR as they become known. This linkage will only be needed by RPO.

3.2.2 Initialize and Maintain Internet Workload [12-2.2]

The internet workload starts with an unsatisfied workload entry for each of the ISR cases in the initial ISR universe. Additional unsatisfied workload entries would be added if additional ID cases are provided from RPO after the initial universe is provided (e.g., from the Supplemental

Universe). A workload entry would be satisfied when a corresponding ID response is received and submitted. For cases that correspond to temporary ID identifiers, a workload entry would both be added and satisfied at the same time when a temporary ID response is received and submitted.

As updates to the internet workload are made, primarily through ISR responses being completed and submitted, ISR will ensure that cases are removed from the internet workload and send a case completion status to RPO. This is done so that once an adequate response is received, the Census Bureau will not continue to send reminders to respond to these cases, and so that the case can be removed from the NRFU universe.

This perspective lets the ISR universe be maintained by RPO as the sum total of all internet-eligible cases while the internet workload is maintained by ISR as the set of all cases remaining to be satisfied by an ISR response.

3.3 Internet Response Data Collection [ISR 12-3]

Figure 9 shows the BPM for the Internet Response Data Collection [ISR 12-3] activity area (area within the gray rounded rectangle) and its constituent activities within the overall context of the ISR operation.

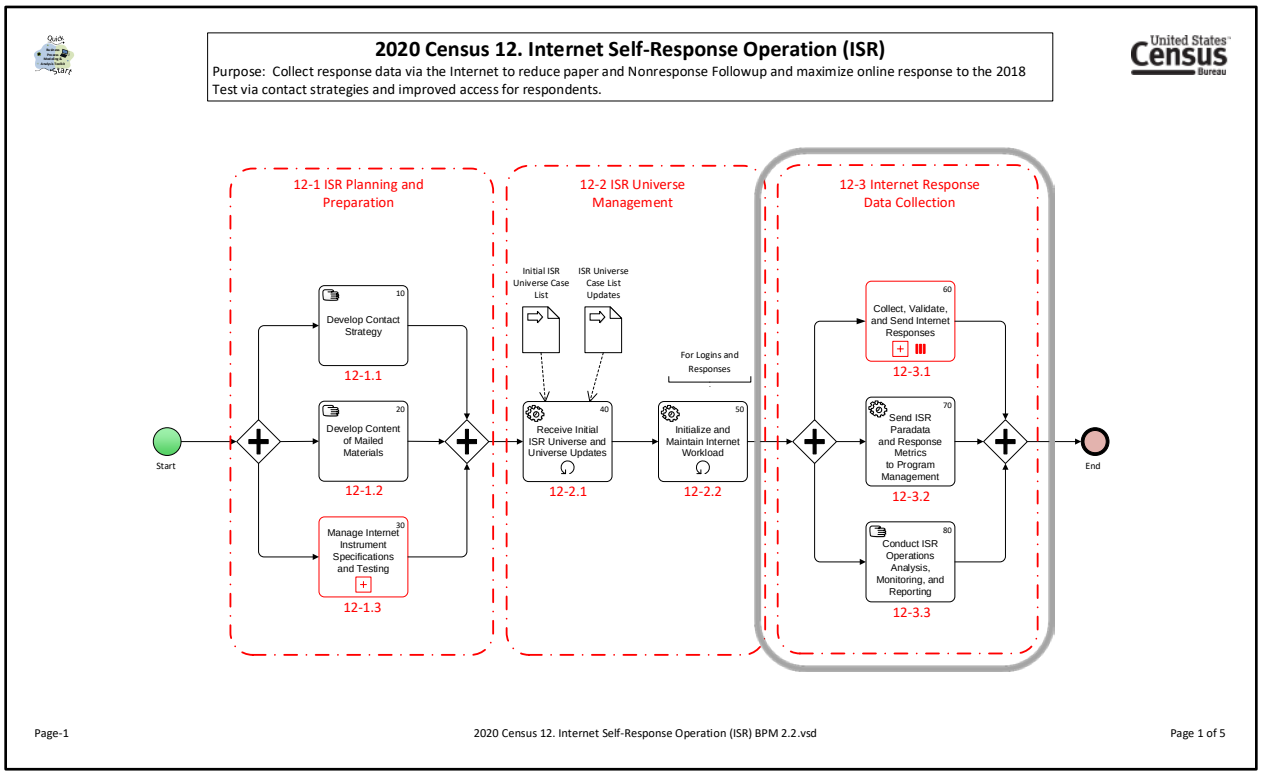

Figure 9: Internet Response Data Collection [ISR 12-3] Constituent Activities

The Internet Response Data Collection activity area is subdivided into the following operational subactivities.

- Internet Response Data Collection [ISR 12-3]
    - Collect, Validate, and Send Internet Responses [ISR 12-3.1]
    - Send ISR Paradata and Response Metrics to Program Management [ISR 12-3.2]
    - Conduct ISR Operations Analysis, Monitoring and Reporting [ISR 12-3.3]

This activity area is the primary activity within the ISR operation. Respondents use the internet application to enter their response data. As internet response data are entered into the ISR application, checks are made to ensure data quality. These checks or validations are in the form of questions that are asked within the application to be sure that a respondent is providing response data for the place they lived on Census Day. These validations are also in the form of edits for respondents without a Census ID (through the NID operation) to ensure that adequate address information is being provided. Lastly, these validations are in the form of soft edits that prompt respondents to provide complete or check information for each question within the application, to ensure data quality.

After a response is provided, those data are sent from the ISR application to downstream systems for further processing. RPO is primarily responsible for the processing. ISR is responsible for making sure that all response data are being transmitted to the downstream systems. In addition to response data, paradata and data on the ISR application's performance are also generated by the ISR application. These data are sent to downstream systems for further processing. ISR ensures that these data are being generated according to established business rules and that the data are being transmitted to downstream systems appropriately.

Subsequent sections describe the Internet Response Data Collection operational subactivities in detail.

3.3.1 Collect, Validate, and Send Internet Responses [ISR 12-3.1]

The "Collect, Validate, and Send Internet Responses" operational subactivity is subdivided into the following constituent activities.

- Collect, Validate, and Send Internet Responses [ISR 12-3.1]
    - Collect and Validate Internet Responses [ISR 12-3.1.1]
    - Translate Non-English and Non-Spanish Content [ISR 12-3.1.2]
    - Send Data to Response Processing [ISR 12-3.1.3]

A detailed view of the constituent activities that make up the "Collect, Validate, and Send Internet Responses" operational subactivity is given in Figure 10 below.

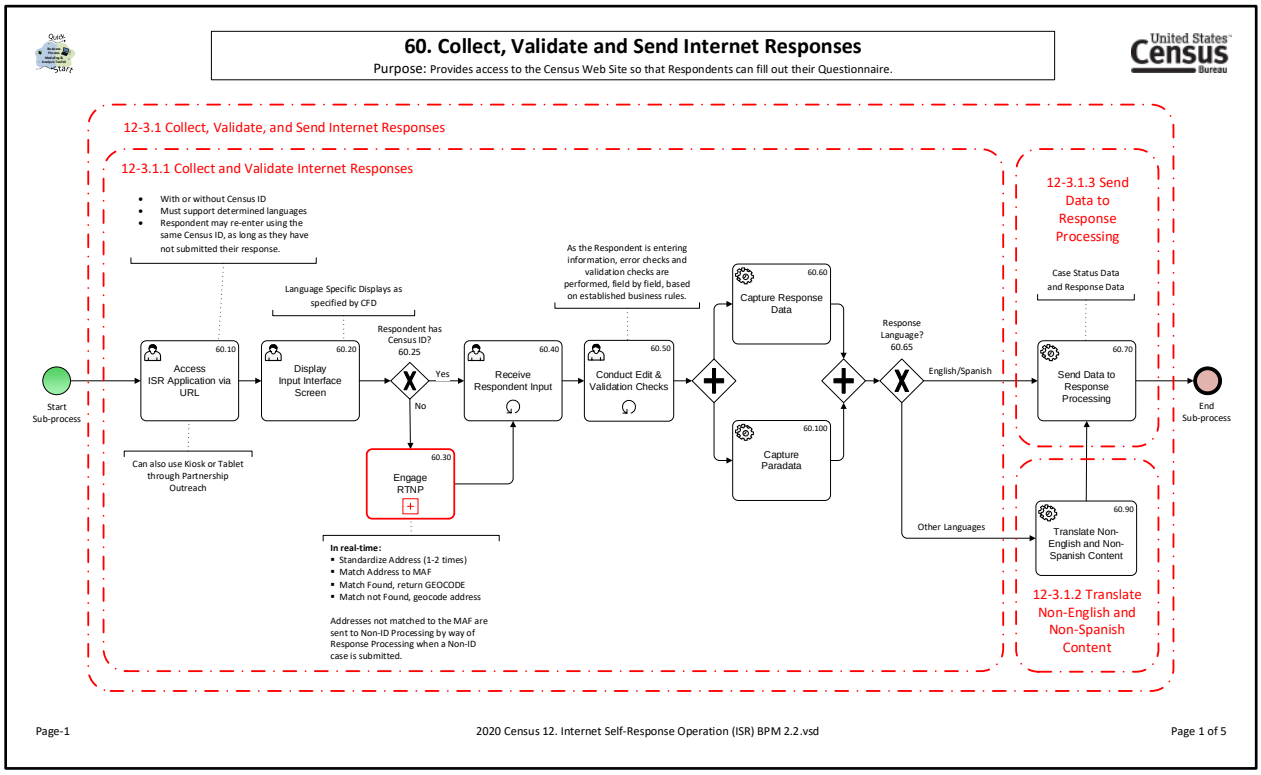

Figure 10: Collect, Validate, and Send Internet Responses

3.3.1.1 Collect and Validate Internet Responses [ISR 12-3.1.1]

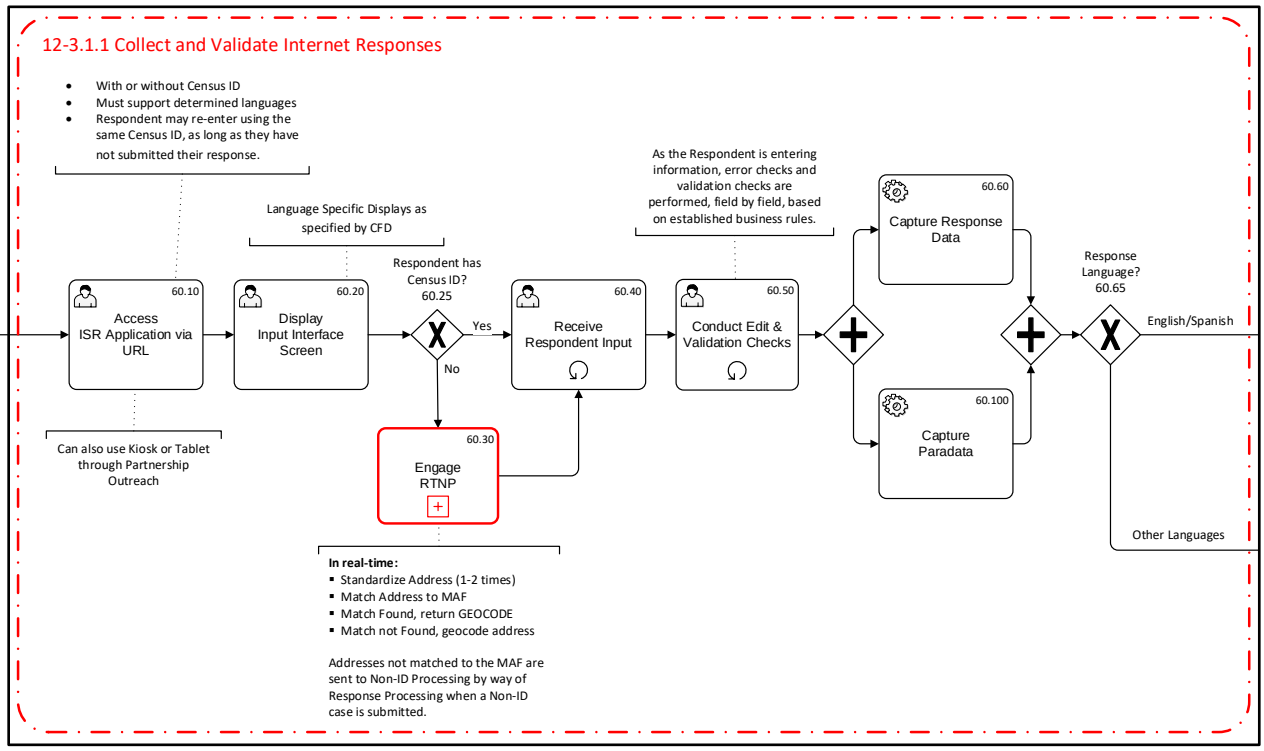

Figure 11: Collect and Validate Internet Responses

Upon accessing the ISR application, a respondent will have the opportunity to select a language that will be displayed within the ISR application. The languages for the user interface display will be defined by the Language Services operation. The user can also change from one language to another, as often as desired, within the ISR application. Upon entering the ISR application, the respondent is prompted to enter the Census ID that was sent in the mail, or to indicate that they do not have a Census ID. If the respondent does not have an ID, the ISR operation collects respondent's physical address and sends it to the NID operation, which attempts to match the respondent's address to an address in the Master Address File (MAF) through real-time non-ID processing (RTNP). These RTNP match results are added to the response data, and the ISR operation continues the survey. Responses to survey questions are checked against existing business rules regarding complete responses and if the respondent-provided data are not complete, edit messages are displayed. These checks and messages exist for every screen/question within the ISR application, specifically to alert the user to any inaccuracies, inconsistencies, or missing data, to increase data accuracy without negatively impacting the overall user experience. Once response data have been entered, and edit checks have been completed for every person within the household and for every response in the ISR application, the response data are ready to be sent to RPO. A respondent is given a final opportunity to

review and edit responses, and then given the opportunity to submit the data. Upon submission, the internet workload entry associated with this case is marked as satisfied and the case status and response data can be sent to RPO to begin further processing for the case. (See Section 3.3.1.3, below.)

3.3.1.2 Translate Non-English Content [ISR 12-3.1.2]

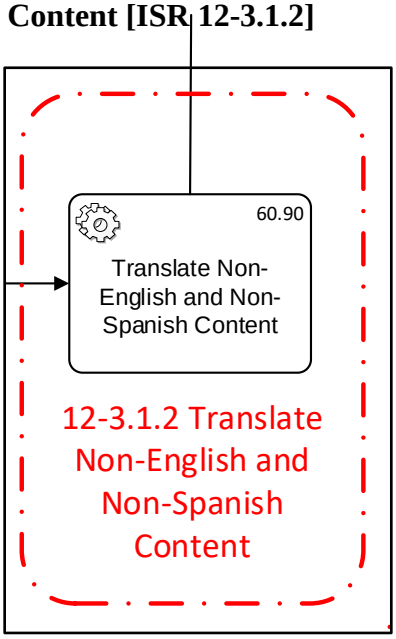

Figure 12: Translate Non-English and Non-Spanish Content

If a user enters non-English or non-Spanish information in certain text boxes in the ISR application, the ISR operation routes those cases to appropriate translators after the user submits the survey. Working with the Decennial Translation Branch, the ISR operation manages the flow of these responses through the translation process, and ensures that the responses are translated. Once the translations are completed, both the original responses and the translated responses are sent to RPO as a single case.

3.3.1.3 Send Data to Response Processing [ISR 12-3.1.3]

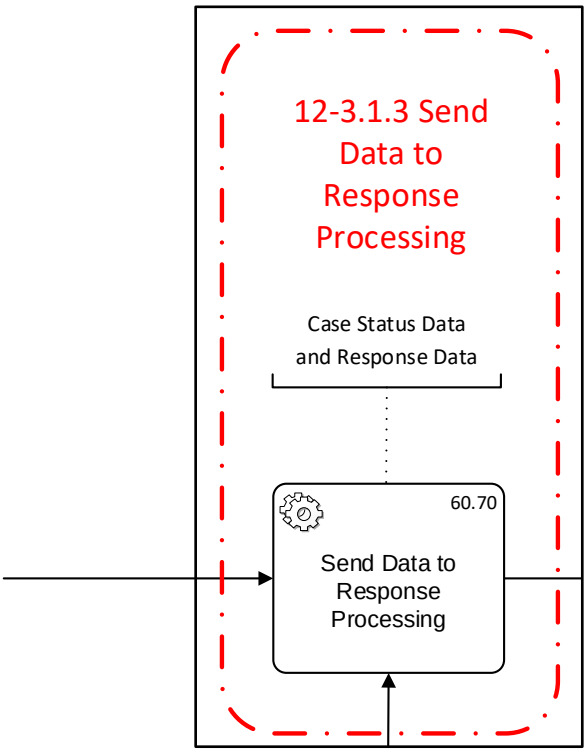

Figure 13: Send Data for Processing

Once users submit responses to the Census Bureau within the ISR application, the data are sent to RPO, which is responsible for ensuring further processing is completed. Additionally, when a respondent leaves the ISR application before completing and submitting the survey, the ISR application will send the partially completed data downstream to RPO for further processing. These data include both the response data as well as event or case status data. The response data are sent to a single repository such that response processing and data analysis can begin. The case status data are used by RPO to make necessary updates to the overall universe.

3.3.2 Send ISR Paradata and Response Metrics to Program Management [ISR 12-3.2]

"Send ISR Paradata and Response Metrics to Program Management" is the second activity performed as part of the Internet Response Data Collection activity area.

In addition to response data, the ISR application collects paradata and data on the ISR application's performance. The paradata consists of data that measure the user's behavior within the ISR application. Specific items, such as the time spent on each screen, or the number of times a user accesses help text are collected in order to better refine the user experience. Paradata is also used to monitor the ISR application such that anomalous user behavior can be identified.

This is done primarily to be able to correct any errors in the ISR application that surface during the internet data collection period. It is also important to note that the paradata will also provide the ISR operation with data needed to monitor the ISR application for potentially fraudulent use.

In addition to the user-based paradata, the ISR application collects paradata related to the performance of the application itself. These data include things like screen load time and server response times, and are used to monitor the application for any disruptions in service. These data are periodically sent to the Program Management (PM) operation, the exact timing of which is not yet determined.

3.3.3 Conduct ISR Operations Analysis, Monitoring and Reporting [ISR 12-3.3]

"Conduct ISR Operations Analysis, Monitoring and Reporting" is the third activity performed as part of the Internet Response Data Collection activity area.

During data collection, ISR is responsible for monitoring the ISR operations to be sure that data are being collected as detailed above. To do this, ISR will examine the paradata and performance data, as well as monitor the ISR application itself to be sure that the application is functioning well. The ISR operation is responsible for developing business rules that indicate potential issues with internet self-response. If any issues arise with the internet self-response or the mail contact strategy, ISR is responsible for informing and working with appropriate parties on resolution of said issues.

Upon completion of internet data collection associated with the 2020 Census, ISR will begin working on multiple reports to assess the 2020 Census ISR operation. These reports will discuss, in detail, quantitative metrics about internet self-response. These reports will discuss performance related details such as the number of concurrent users or the number of users by a specified unit of time (hourly, daily, or weekly). Reports will also detail paradata-related aspects of the ISR application such as the average time spent per screen, the number of breakoffs per screen, average completion time of the survey, etc. Finally, ISR will write reports that detail the overall demographics and household characteristics of those that provided response data online. A detailed listing of reports to be done is forthcoming.

4. Cost Factors

4.1 Background

The investment in ISR is projected to influence (reduce 🡻 or increase 🡹) the 2020 Census overall costs in the following ways:

- 🡻 Increased self-response, which will decrease the nonresponse follow-up workload, thereby reducing field costs.
- 🡻 Reduced proportion of self-response through paper questionnaire.

In addition:

- 🡹 Internet Self-Response is expected to increase the workload for CQA.

4.2 Relevant IDEF0 Mechanisms

While the ISR operation is not a major cost driver for the 2020 Census, the following mechanisms from the IDEF0 Context Diagram represent the resources used to support this operation and comprise part of the 2020 Census cost elements:

Staff

- Headquarters (HQ) staff
- Translation contractors
- Census Questionnaire Assistance (CQA) Customer Service Representatives (CSR)

Sites

- HQ
- Census data hosting sites

Systems

- Enterprise Censuses and Surveys Enabling platform (ECaSE)-Internet Self-Response (ISR)

Other

- HQ office IT infrastructure
- Census Bureau networks
- Devices through partnerships

5. Measures of Success

For 2020 Census operations, the corresponding Measures of Success will be documented in the operational assessment study plans and final reports. The operational assessment study plan documents the criteria that will be used to define successful completion of the operation. The operational assessment report will provide results on whether the criteria were met.

In general, operational assessments report on planned to actual variances in budget, schedules, and production and training workloads. The corresponding Measures of Success (as documented in the operational assessment study plan) include variances that exceeded established thresholds. See *Preparing for the 2020 Census Operational Assessment Study Plan* for the potential scope of assessment.

Types of success measures include:

- **Process Measures** that indicate how well the process works, typically including measures related to completion dates, rates, and productivity rates.
- **Cost Measures** that drive the cost of the operation and comparisons of actual costs to planned budgets. Costs can include workload as well as different types of resource costs.
- **Measures of the Quality** of the results of the operation, typically including things such as rework rates, error rates, and coverage rates.

See the corresponding operational assessment study plan and report for the ISR for details on the measures of success.

Appendix A – Acronyms and Terminology

Table 8 lists the acronyms and abbreviations used within this Detailed Operational Plan document.

Table 9 lists a Glossary of Terms used within this Detailed Operational Plan document.

Table 8: Acronyms and Abbreviations List

Acronym	Meaning
ACO	Area Census Office
BPM	Business Process Model
BPMN	Business Process Model and Notation
CDL	Census Data Lake
CEDCaP	Census Enterprise Data Collection and Processing
CEF	Census Edited File
CFD	Content and Forms Design operation
CI	Coverage Improvement
COTS	Commercial Off the Shelf
CQA	Census Questionnaire Assistance
CRO	Count Review Operation
CSR	Customer Service Representative
CUF	Census Unedited File
DLM	Decennial Logistics Management Operation
DOP	Detailed Operational Plan
DPD	Data Products and Dissemination Operation
DRF	Decennial Response File

Acronym	Meaning
DSC	Decennial Service Center Operation
EAE	Evaluations and Experiments Operation
ECaSE	Enterprise Censuses and Surveys Enabling platform
ETL	Enumeration at Transitory Locations operation
FLDI	Field Infrastructure Operation
FPD	Forms Printing and Distribution Operation
GDP	Geographic Data Processing
GEOP	Geographic Programs operation
GQ	Group Quarters Operation
IA	Island Areas
IAC	Island Areas Censuses Operation
IDEF0	Integrated Definition, Level 0
IE	Information Exchange
IOD	Integrated Operations Diagram
IPC	Integrated Partnership and Communications operation
ISR	Internet Self-Response operation
IT	Information Technology
ITIN	IT Infrastructure Operation
LUCA	Local Update of Census Addresses Operation
MAF	Master Address File
MDF	Microdata Detail File
NID	Non-ID Processing operation

Acronym	Meaning
NRFU	Nonresponse Followup operation
PDC	Paper Data Capture operation
PR	Puerto Rico
QC	Quality Control
RI	Reinterview
RPO	Response Processing operation
RTNP	Real Time Non-ID Processing
SR	Self-Response
TEA	Type of Enumeration Area
UE	Update Enumerate operation
UL	Update Leave Operation
USPS	United States Postal Service

Table 9: Glossary of Terms

Term	Meaning
Business Process Model and Notation Context Model	A BPMN Context Model displays the high-level activities within the operation and relationships between them.
Context Diagram	A Context Diagram shows the boundary of the operational process, the operational activities it contains, and the information exchanged with its neighbor operations (or other entities) as well as the resources (mechanisms) needed to conduct the operational work.
IDEF0 Model	An IDEF0 Model of a process (or operation) shows the Inputs, Controls, Outputs and Mechanisms of the process.

Term	Meaning
ISR application	The internet application used for self-response. The ISR application will be used for self-administered response and responses gathered by Census Questionnaire Assistance.

Appendix B – References

Appendix B lists the documents or other resources referenced within this Detailed Operational Plan document.

U.S. Census Bureau (2017), “2020 Census Operational Plan,” Version 3.0, October 27, 2017.

U.S. Census Bureau (2016), “Operational Assessment Content Guidelines for the 2018 End-to-End Census Test and the 2020 Census,” Draft, May 10, 2016.

Appendix C – Activity Tree for Internet Self-Response Operation (ISR)

This appendix presents the Activity Tree for the ISR operation. An Activity Tree uses an outline structure to reflect the decomposition of the major operational activities in the operation. Each activity is numbered according to its position in the outline. For example, for the current operation numbered "12," the first activity would be numbered 12-1. Subactivities under this activity would be numbered sequentially, starting again with the number one. For example, the first subactivity under the first activity would be numbered 12-1.1 the second subactivity as 12-1.2. The second activity would be numbered 12-2, and so on.

ISR Activity Tree:

- 12-1. ISR Planning and Preparation
  - 12-1.1 Develop Contact Strategy
  - 12-1.2 Develop Content of Mailed Materials
  - 12-1.3 Manage Internet Instrument Specifications and Testing
- 12-2 ISR Universe Management
  - 12-2.1 Receive Initial ISR Universe and Universe Updates
  - 12-2.2 Initialize and Maintain Internet Workload
- 12-3 Internet Response Data Collection
  - 12-3.1 Collect, Validate, and Send Internet Responses
    - 12-3.1.1 Collect and Validate Internet Responses
    - 12-3.1.2 Translate-Non-English and Non-Spanish Content
    - 12-3.1.3 Send Data to Response Processing
  - 12-3.2 Send ISR Paradata and Response Metrics to Program Management
  - 12-3.3 Conduct ISR Operations Analysis, Monitoring and Reporting